

XVI SCIENTIFIC MEETING

OF THE SPANISH SOCIETY
OF CHROMATOGRAPHY
AND RELATED TECHNIQUES

ALMERÍA 25TH-27TH OCTOBER 2022

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PALACIO DE EXPOSICIONES Y CONGRESOS CABO DE GATA CIUDAD DE ALMERÍA

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CIESOL
CENTRO DE INVESTIGACIÓN EN ENERGÍA SOLAR
CENTRO MIXTO UAL - PSA CIEMAT



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CERTIFICATE of ATTENDANCE

This is to certify that:

ANTONIA GARRIDO FRENICH

has attended the

XXI SCIENTIFIC MEETING OF THE SPANISH SOCIETY OF CHROMATOGRAPHY AND RELATED TECHNIQUES

held in Almería from October 25th to 27th, 2022

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Ana Agüera
Chairwoman
UNIVERSITY OF ALMERÍA

APPLICATION OF UHPLC-Q-EXACTIVE-ORBITRAP MS FOR THE COMPREHENSIVE DISSIPATION AND DEGRADATION STUDY OF CHLORANTRANILIPROLE BASED PLANT PROTECTION PRODUCTS IN SOIL

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Chlorantraniliprole, belonging to the anthranilic diamide family, is a broad-spectrum pesticide with a long persistence in soil [1]. The information reported on the dissipation and formation of chlorantraniliprole metabolites in soil is very scarce, which leads to misinformation about the risk of this compound [2]. To improve this aspect, a comprehensive evaluation of the dissipation and degradation of a chlorantraniliprole plant protection product (PPP) was carried out in loam-clay-sandy soil, representative of the greenhouse area of southern Spain, under laboratory conditions. The PPP was applied at the dose recommended by the manufacturer (180 g ha^{-1}) and at double dose. Solid-liquid extraction combined Ultrasound Assisted Extraction (UAE) and QuEChERS followed by Ultra-high performance liquid chromatography coupled to a Q-Exactive-Orbitrap Mass Spectrometer (UHPLC-Q-Exactive-Orbitrap MS) was applied. Complete ion scan (full scan) and Data independent acquisition (DIA), both modes with positive and negative ionizations, were applied to increase the search range. Furthermore, for data analysis, specialized software such as Xcalibur and MassFrontier were used. The results showed that the dissipation kinetics of chlorantraniliprole followed a "Single First-Order Rate" (SFO) model with a half-life of 210 days. This value suffered an increase, 313 days, in the case of the application at the double dose. By combining suspect and unknown screenings, 5 metabolites of chlorantraniliprole were detected. It should be noted that the 5-bromo-N-methyl-1H-pyrazole-3-carboxamide metabolite appeared throughout the study period (7 months) with a maximum tentative concentration of $250 \mu\text{g kg}^{-1}$. Its presence in soil can lead to an environmental risk given its high toxicity to earthworms. These results make evident the need to study these pesticide degradates because they can target different type of organism than the original compound.

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References:

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